

ABSTRACT OF THE DISCLOSURE

This invention resides in an apparatus and related method for rapidly curing thin film sol-gel coatings, particularly such coatings adhered to low melting temperature plastic substrates, whether rigid or flexible, without deforming the substrate. The curing is achieved using IR heating lamps and dry or humid hot gas flow. This curing densifies the sol-gel coating and provides desired optical and mechanical properties. The use of IR lamps and hot-gas nozzles, either singularly or in combination, produces a rapid cure by effectively heating the thin film coating layer. In this manner, a sufficiently high temperature can be attained in the film layer, to densify the sol-gel coating, but for a sufficiently short time duration to avoid melting or otherwise deforming the substrate. The sol-gel coatings can be cured two to three orders of magnitude faster than with conventional oven curing, leading to significant cost reductions and manufacturing efficiency.